

## Claims

- [c1] 1.A current reference circuit comprising:  
a first n-channel field effect transistor (NFET) having a gate and a drain that are coupled together; and  
a second NFET having a floating body.
- [c2] 2.The current reference circuit of claim 1 wherein the first NFET includes a body that is grounded.
- [c3] 3.The current reference circuit of claim 2 wherein the first and the second NFETs comprise silicon-on-insulator field effect transistors.
- [c4] 4.The current reference circuit of claim 3 wherein the second NFET includes a gate that is coupled to the gate of the first NFET.
- [c5] 5.The current reference circuit of claim 4 further comprising a resistive element and wherein:  
the first NFET includes a source that is grounded; and  
the second NFET includes a source that is coupled to ground via the resistive element.
- [c6] 6.The current reference circuit of claim 5 further comprising:

a first p-channel field effect transistor (PFET) having:  
a gate;  
a drain coupled to the drain of the first NFET; and  
a source adapted to couple to a supply voltage; and  
a second PFET having:  
a gate coupled to the gate of the first PFET;  
a drain coupled to the gate of the second PFET and the  
drain of the second NFET; and  
a source adapted to couple to the supply voltage.

- [c7] 7.The current reference circuit of claim 5 wherein the supply voltage comprises a voltage of about 0.5 volts.
- [c8] 8.The current reference circuit of claim 5 further comprising:
  - a third NFET having:
    - a gate and a drain that are coupled together; and
    - a source coupled to the drain of the first NFET; and
  - a fourth NFET having:
    - a gate coupled to the gate of the third NFET; and
    - a source coupled to the gate of the fourth NFET and the drain of the second NFET.
- [c9] 9.The current reference circuit of claim 8 wherein the fourth NFET includes a drain and further comprising:
  - a first PFET having:
    - a gate; and

a drain coupled to the drain of the third NFET; and  
a second PFET having:  
a gate coupled to the gate of the first PFET; and  
a drain coupled to the gate of the second PFET and the  
drain of the fourth NFET.

- [c10] 10. The current reference circuit of claim 9 wherein the first PFET and the second PFET each include a source and further comprising:
- a third PFET having:  
    a gate;  
    a drain coupled to the source of the first PFET; and  
    a source adapted to couple to a supply voltage; and  
    a fourth PFET having:  
    a gate coupled to the gate of the third PFET;  
    a drain coupled to the gate of fourth PFET and the source  
    of the second PFET; and  
    a source adapted to couple to the supply voltage.
- [c11] 11. The current reference circuit of claim 10 wherein the supply voltage comprises a voltage of about 3.3 volts.
- [c12] 12. A method of providing a reference current comprising:  
    providing a current reference circuit having:  
    a first n-channel field effect transistor (NFET) having a  
    gate and a drain that are coupled together; and

a second NFET having a floating body; and employing the current reference circuit to generate a reference current within at least one of the first NFET and the second NFET.

- [c13] 13. The method of claim 12 wherein the first and the second NFETs comprise silicon-on-insulator field effect transistors.
- [c14] 14. The method of claim 12 wherein the second NFET includes a gate that is coupled to the gate of the first NFET.
- [c15] 15. The method of claim 14 wherein the current reference further comprises a resistive element and wherein: the first NFET includes a source that is grounded; and the second NFET includes a source that is coupled to ground via the resistive element.
- [c16] 16. The method of claim 15 wherein the current reference circuit further comprises:
  - a first p-channel field effect transistor (PFET) having:
    - a gate;
    - a drain coupled to the drain of the first NFET; and
    - a source adapted to couple to a supply voltage; and
  - a second PFET having:
    - a gate coupled to the gate of the first PFET;

a drain coupled to the gate of the second PFET and the drain of the second NFET; and  
a source adapted to couple to the supply voltage.

- [c17] 17. The method of claim 15 further comprising employing about a 0.5 volt supply voltage to drive the current reference circuit.
- [c18] 18. The method of claim 15 wherein the current reference circuit further comprises:
- a third NFET having:
    - a gate and a drain that are coupled together; and
    - a source coupled to the drain of the first NFET;
  - a fourth NFET having:
    - a drain;
    - a gate coupled to the gate of the third NFET; and
    - a source coupled to the gate of the fourth NFET and the drain of the second NFET;
  - a first PFET having:
    - a source;
    - a gate;
    - a drain coupled to the drain of the third NFET;
  - a second PFET having:
    - a source;
    - a gate coupled to the gate of the first PFET; and
    - a drain coupled to the gate of second PFET and the drain of the fourth NFET;

a third PFET having:  
a gate;  
a drain coupled to the source of the first PFET; and  
a source adapted to couple to a supply voltage; and  
a fourth PFET having:  
a gate coupled to the gate of the third PFET;  
a drain coupled to the gate of fourth PFET and the source  
of the second PFET; and  
a source adapted to couple to the supply voltage.

- [c19] 19. The method of claim 18 further comprising employing about a 3.3 volt supply voltage to drive the current reference circuit.
- [c20] 20. A current reference circuit comprising:  
a first n-channel field effect transistor (NFET) having a gate and a drain that are coupled together; and  
a second NFET having a floating body;  
wherein the first and second NFETs are configured so as to generate a reference current at a supply voltage of not more than about 0.5 volts.